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| APPLICATION NO. | FILING DATE | FIRST NAMED INVENTOR | ATTORNEY DOCKET NO. | CONFIRMATION NO. |
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| 10/674,704 | 09/30/2003 | Tony A. Opheim | 42.P16903 | 4545 |

7590

10/20/2005

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EXAMINER

ANDUJAR, LEONARDO

ART UNIT

PAPER NUMBER

2826

DATE MAILED: 10/20/2005

Please find below and/or attached an Office communication concerning this application or proceeding.

| | | | |
|------------------------------|--------------------------------------|--|--|
| Office Action Summary | Application No. 10/674,704 | Applicant(s) OPHEIM, TONY A. | |
| | Examiner Leonardo Andújar | Art Unit 2826 | |

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 11 July 2005.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-5,7 and 20-27 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1,20,24,25 and 27 is/are rejected.
- 7) ☐ Claim(s) 3-5,21-23 and 26 is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 30 September 2003 is/are: a) ☐ accepted or b) ☒ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. _____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- * See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|--|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413) Paper No(s)/Mail Date. _____ |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152) |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) Paper No(s)/Mail Date _____ | 6) <input type="checkbox"/> Other: _____ |

DETAILED ACTION

Acknowledgment

1. The amendment filed on 7/11/2005 in response to the Office action mailed on 04/19/2005 has been entered. The present Office action is made with all the suggested amendments being fully considered. Accordingly, pending in this Office action are claims 1-5, 7 and 20-27.

Election/Restrictions

2. Applicant's election without traverse of group I (claims 1-7 and 20-27) in the reply filed on 04/05/2005 is acknowledged.

Drawings

3. The drawings are objected to under 37 CFR 1.83(a). The drawings must show every feature of the invention specified in the claims. Therefore, the contact coupled to a device of the die according to claim 1, 20 and 24, must be shown or the feature(s) canceled from the claim(s). No new matter should be entered. Corrected drawing sheets in compliance with 37 CFR 1.121(d) are required in reply to the Office action to avoid abandonment of the application. Any amended replacement drawing sheet should include all of the figures appearing on the immediate prior version of the sheet, even if only one figure is being amended. The figure or figure number of an amended drawing should not be labeled as "amended." If a drawing figure is to be canceled, the appropriate figure must be removed from the replacement sheet, and where necessary, the remaining figures must be renumbered and appropriate changes made to the brief description of the several views of the drawings for consistency. Additional replacement

sheets may be necessary to show the renumbering of the remaining figures. Each drawing sheet submitted after the filing date of an application must be labeled in the top margin as either "Replacement Sheet" or "New Sheet" pursuant to 37 CFR 1.121(d). If the changes are not accepted by the examiner, the applicant will be notified and informed of any required corrective action in the next Office action. The objection to the drawings will not be held in abeyance.

Claim Rejections - 35 USC § 102

4. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

5. Claims 1 and 7 are rejected under 35 U.S.C. 102(b) as being anticipated by Finnila (US 5,426,072).

6. Regarding claim 1, Finnila (e.g. figs. 6) shows a die comprising: a dielectric layer 20/13 positioned on top of a semiconductor support layer 11/12; a via passing through the dielectric layer and the semiconductor support layer, wherein a first end of the via is positioned in the dielectric layer and a second end of the via is positioned in the semiconductor support layer, wherein a first diameter of the first end is greater than a second diameter of the second end; and a contact 21 positioned on top of the dielectric layer, the contact coupled to the first end of the via, wherein the contact to be coupled to a device of the die (e.g. transistor).

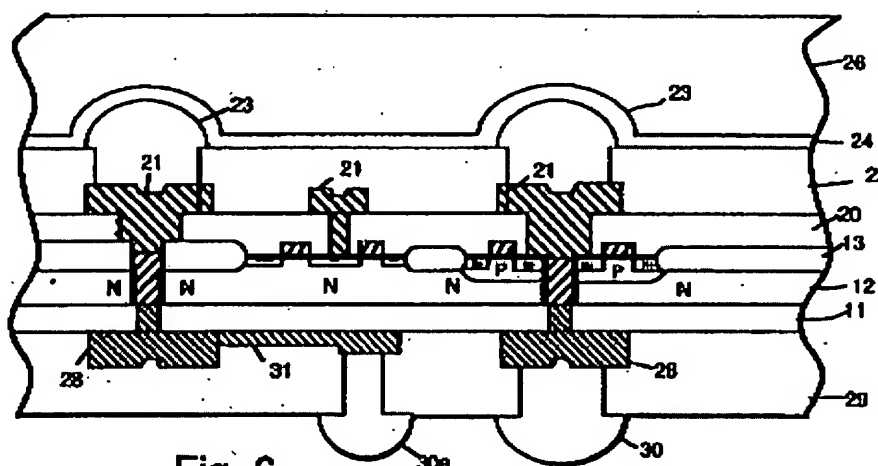


Fig. 6

7. Regarding claim 7, Finnila shows that the via includes a metal filled via (col. 4/II.

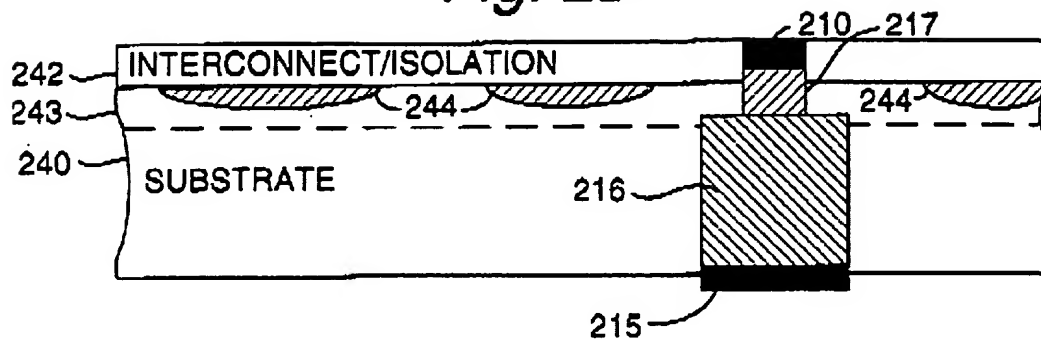
Claim Rejections - 35 USC § 103

8. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

9. Claims 2 is rejected under 35 U.S.C. 103(a) as being unpatentable over Finnila (US 5,426,072) in view of Hsuan (US 6,429,509).
10. Regarding claim 2, Finnila shows most aspects of the instant invention except for a shaft between the first end and the second end wherein the shaft has a diameter similar to the second diameter. Nevertheless, Hsuan (e.g. fig. 2D) a via including a shaft between a first end 216 and the second end 217 wherein the shaft has a diameter similar to the second diameter.

Fig. 2D



According to Hsuan, this type of interconnection minimizes the I/O signal attenuation, inductance and capacitance of integrated circuit (col. 3/lls. 42-45). It would have been obvious to one of ordinary skill in the art at the time the invention was made to make the vias disclosed by Finnila having a shaft between the first end and the second end wherein the shaft has a diameter similar to the second diameter in accordant to Hsuan's invention to minimize the I/O signal attenuation, inductance and capacitance of integrated circuit.

11. Claim 20, 24 and 27 are rejected under 35 U.S.C. 103(a) as being unpatentable over Finnila (US 5,426,072) in view of Gnadinger (US 5,229,647).

12. Regarding claims 20 and 24, Finnila (e.g. figs. 6) shows a die package or a processor (col. 7/ll. 46), comprising: a semiconductor support layer 11/12; a dielectric layer 20/13 disposed on the semiconductor support layer; a via including a first end and a second end, the first end positioned the dielectric layer and the second end positioned in the semiconductor support layer, wherein a diameter of the first end is greater than a diameter of the second end; a first contact 21, disposed on the dielectric layer, coupled to the first end of the via, wherein the first contact coupled to a device of the die package (e.g. transistor); and a second contact 30, disposed on the semiconductor

support layer, coupled to the second end of the via. Finnila does not show that the second contact is mounted a printed circuit board. Nevertheless, Grainger (e.g. fig. 4 and 3) shows a second contact 20 mounted on a printed circuit board 17. It would have been obvious to one of ordinary skill in the art at the time the invention was made to mount the second contact disclosed by Finnila on a printed circuit board in accordance with Grainger's invention to provide support, an interconnection means as well as a heat dissipation means.

13. Regarding claim 27, Finnila shows that the first diameter is twice the second diameter.

14. Claim 25 is rejected under 35 U.S.C. 103(a) as being unpatentable over Finnila (US 5,426,072) in view of Gnadinger (US 5,229,647) in view of Hsuan (US 6,429,509).

15. Regarding claim 25, Finnila in view of Gnadinger shows most aspects of the instant invention except for a shaft between the first end and the second end wherein the shaft has a diameter similar to the second diameter. Nevertheless, Hsuan (e.g. fig. 2D) shows a via including a shaft between a first end 216 and the second end 217 wherein the shaft has a diameter similar to the second diameter. According to Hsuan, this type of interconnection minimizes the I/O signal attenuation, inductance and capacitance of integrated circuit (col. 3/lls. 42-45). It would have been obvious to one of ordinary skill in the art at the time the invention was made to make the vias disclosed by Finnila having a shaft between the first end and the second end wherein the shaft has a diameter similar to the second diameter in accordant to Hsuan's invention to minimize the I/O signal attenuation, inductance and capacitance of integrated circuit

Allowable Subject Matter

16. Claims 3-5, 21-23 and 26 are objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

Response to Arguments

17. Applicant's arguments have been considered but are moot in view of the new ground(s) of rejection.

Conclusion

18. Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the date of this final action.

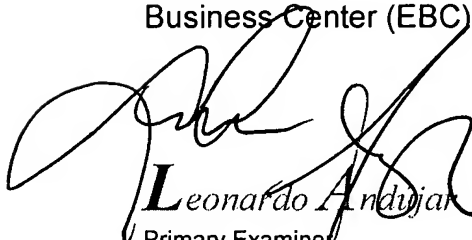
19. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Leonardo Andújar whose telephone number is 571-272-

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1912. The examiner can normally be reached on Mon through Thu from 9:00 AM to 7:30 PM EST.

20. If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Nathan J. Flynn can be reached on 571-272-1915. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

21. Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).



Leonardo Andujar
Primary Examiner
Art Unit 2826
10/10/2004